RRRRRRRR RRRRRRRR RRRRRRRRR	RRR	MMM MMM MMM	MMM MMM MMM	SSSSSSSSSSS SSSSSSSSSSS SSSSSSSSSSSSSS
RRR RRR RRR RRR RRR	RRR RRR RRR RRR	MMMMMM MMMMMM MMMMMM MMM MM	MMMMMM MMMMMM MMMMMM MMM MMM	SSS SSS SSS SSS SSS
RRR RRRRRRRRR RRRRRRRRR RRRRRRRRR RRR RRR RRR RRR	RRR	MMM MM MMM MMM MMM MMM MMM	MMM MMM MMM MMM MMM	\$\$\$ \$\$\$\$\$\$\$\$\$ \$\$\$\$\$\$\$\$\$ \$\$\$\$ \$\$\$
RRR RRR RRR RRR	RRR RRR RRR RRR RRR RRR	MMM MMM MMM MMM MMM MMM	MMM MMM MMM MMM MMM MMM	\$\$\$ \$\$\$ \$\$\$ \$\$\$ \$\$\$\$ \$\$\$\$\$\$\$\$\$\$\$\$\$ \$\$\$\$\$

\_\$;

Syr NT! NT! NT! NT! NT!

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NT NT NT NT NT PI

RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR	MM MM MMM MMM MMMM MMMM MM MM MM MM MM M	333333 333333 33 33 33 33 33 33 33 33 3	PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP	000000 00 00 00 00	\$	KK	YY Y
LL LL LL LL LL LL LL LL LL LL LL LL LL		\$					

RM3 V04

RM3

V04

MODULE RM3PCSKEY (LANGUAGE (BLISS32),
IDENT = 'V04-000'
) =

BEGIN

1.

1 1

1 1 1 1 \*

1 1

1 1

0002 0003 0004

0005 9006 0007

0008 0009

0010

0011

0012

0014 0015 0016

0017

0018

0019

0020

0028

0032

0034

0035 0036 0037

0038 0039

0040 0041

0046 0047 0048

0049

0050

0051 0052

0054

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RMS32 index sequential file organization FACILITY:

ABSTRACT:

This module positions to a record by key value.

**ENVIRONMENT:** 

VAX/VMS Operating System

0042 0044

**AUTHOR:** Todd M. Katz RE-CREATION DAIE: 17-Jan-83

MODIFIED BY:

V03-007 TSK0001 Tamar Krichevsky 15-Jun-1983 Change addressing mode for RM\$RU\_RECLAIM to long relative.

V03-006 MCN0002 22-Mar-1983 Maria del C. Nasr More changes in the linkages

V03-005 MCN0001 24-Feb-1983 Maria del C. Nasr Reorganize linkages

0055 0056

```
K 12
                                                                                   16-Sep-1984 01:55:13
14-Sep-1984 13:01:33
RM3POSKEY
                                                                                                                   VAX-11 Bliss-32 V4.0-742
V04-000
                                                                                                                   [RMS.SRC]RM3POSKEY.B32;1
     58
59
                    0058
0059
                                         V03-004 TMK0003
                                                                         Todd M. Katz
                                                                                                        17-Jan-1983
                                                    Re-write the routines within this module adding support for
                    0060
     60
                                                    Recovery Unit Journalling and RU ROLLBACK Recovery of ISAM
                    0061
     61
                    0063
0063
    6<u>2</u>
    64
                    0064
                    0065
                               LIBRARY 'RMSLIB:RMS':
    66
67
                    0066
                    0067
0132
0133
0134
0135
                               REQUIRE 'RMSSRC:RMSIDXDEF':
    Define default PSECTS for code.
                               PSECT
                    0136
                                    CODE = RM$RMS3(PSECT_ATTR),
                                    PLIT = RMSRMS3(PSECT_ATTR);
                    0138
0139
                               ! Linkages.
                    0140
                    0141
                               LINKAGE
                    0142
                                    L_RABREG_67,
L_PRESERVE1;
                    0144
                                 External Routines.
                    0146
                              EXTERNAL ROUTINE
RM$CSEARCH_TREE
                    0148
0149
0150
0151
                                                              : RL$RABREG_67,
: RL$RABREG_67,
: RL$PRESERVE1,
: RL$RABREG_67 ADDRESSING_MODE( LONG_RELATIVE ),
: RL$RABREG_67;
                                    RMSGETNEXT_REC
     86
                                    RM$RLSBKT
    87
                                    RM$RU_RECLAIM
RM$SEĀRCH_SIDR
                    0152
    88
```

RM3

**V04** 

Page

REL

RM3 V04

: R

(2)

```
M 12
                                                                             16-Sep-1984 01:55:13
14-Sep-1984 13:01:33
RM3POSKEY
                                                                                                          VAX-11 Bliss-32 V4.0-742
                                                                                                                                                      Page
V04-000
                                                                                                           [RMS.SRC]RM3POSKEY.B32:1
   147
                   0210
0211
0212
0213
0214
0216
0216
0217
0218
0219
0220
                               SIDE EFFECTS:
   148
                                      On success, REC_ADDR points to the non-deleted primary data record
   150
151
152
153
154
155
156
157
158
                                           and the BDB of the primary data bucket maybe found in IRB$L_CURBDB.
                                       On failures, all accessed buckets are released.
                                       If RU_DELETEd records are encountered, they might have been deleted.
                                       If RU_UPDATEd records are encountered, they might have been reformatted.
                          222222222222222222222222
                                  BEGIN
                                  BUILTIN
   160
                                      AP:
   161
                                  EXTERNAL REGISTER
   162
                                      COMMON RAB STR, R IDX DFN STR,
   163
   164
                                      R_REC_ADDR_STR;
   165
   166
   167
                                    Initialize several variables, and then position to the (primary or
   168
                                    secondary) data record by key value.
   169
                                  iRAB[IRB$B_STOPLEVEL] = 0;
IRAB[IRB$L_CURBDB] = 0;
IRAB[IRB$W_SAVE_POS] = 0;
   170
   171
   172
   173
   174
                                  RETURN_ON_ERROR (RM$CSEARCH_TREE());
                   0238
   175
   176
                   0239
                                    If RMS is to position by primary key, then position to the first
                   0240
   177
                                    non-deleted primary data record whose primary key matches the search key
                   0241
0242
0243
   178
                                    according to the characteristics of the search.
   179
   180
                                  IF .IDX_DFN[IDX$B_KEYREF] EQLU 0
                   0244
   181
182
183
184
185
186
187
188
189
                                  THEN
                                      BEGIN
                   0246
0247
0248
                                                (.REC_ADDR[IRC$x_DELETED]
                                      WHILE
                                                .REC_ADDR[IRC$V_RU_DELETE])
                                      DO
                                           BEGIN
   190
                                             If RMS finds that the current record has been deleted within a
   191
                                             Recovery Unit, then it subjects this record to further processing
   192
                                              before deciding whether to return this record as the non-deleted
   193
                   0256
                                             primary data record, or to continue with the search.
   194
                   0257
   195
                   0258
                                            IF .REC_ADDR[IRC$V_RU_DELETE]
   196
                   0259
                                           THEN
   197
                   0260
                                                BEGIN
   198
                   0261
                   0262
0263
   199
                                                LOCAL
   200
                                                     RECORD_ID : WORD,
   201
202
203
                   0264
                                                     STATUS:
                   0265
                   0266
                                                RECORD_ID = .REC_ADDR[IRC$W_ID];
```

RM3

V04

Page

```
0290
0291
0294
0296
0297
0298
0299
0300
0301
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0303
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0306
0307
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0309
0310
0311
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0314
0315
0316
```

0317

0318

0319

0320

if .REC\_ADDR[IRC\$V\_RU\_UPDATE]

.IFAB[IFB\$V\_WRTACC]

AND'

AND

```
If RMS finds that Recovery Unit in which this record was
         locked is still active or the file has nor been opened for
         write access, then RMS can not delete this record. If another
         stream has the current record locked, RMS returns the record
         as the non-deleted primary data record, and lets a higher level routine decide what to do with it. However, if it is
         the current stream that has the record locked, or if the
         current stream is able to lock the record but does not have
         write access to the file, then RMS considers the current record to be deleted, and positions to the next record in
         order to continue the search.
       IF NOT (STATUS = RM$RU_RECLAIM())
           IF .STATUS<0,16> EQLU RMSERR(RLK)
           THEN
               EXITLOOP
           ELSE
               RM$GETNEXT_REC()
        If RMS is able to reclaim only some of the space occupied
         by the corrent primary data record it proceeds to
         position to the next record; otherwise, it is already
         positioned there.
              .PECORD_ID EQLU .REC_ADDR[IRC$W_ID]
           THEN
               RM$GETNEXT_REC();
      END
    If the current record is marked deleted, then continue the search
    for a non-deleted primary data record with the next record in the
    bucket.
  ELSE
      RMSGETNEXT_REC();
  ! The previous records RMS has looked at were all deleted. If the
    record RMS has positioned to matches the key in keybuffer 2
    according to the search characteristics then continue with the search to see if it too is marked deleted, or whether it maybe
    returned as the non-deleted primary data record.
  RETURN_ON_ERROR (RM$CSEARCH_TREE());
  END:
RMS has found a record to return as the non-deleted primary data
record. If this record was updated within a Recovery Unit, then
re-format the record provided the Recovery Unit has completed and the
stream has write access to the file.
```

```
NOT .REC_ADDR[IRC$V_RU_DELETE]
262
263
264
265
266
268
                                    THEN
                                         RM$PU_RECLAIM();
                                      RMS has found a record to return. Extract the record's ID and the
                                      VBN of the bucket it is in for use in updating the NRP, and then
                                      return success.
                                   irab[irb$w_rfa_id] = irc$_id(rec_addr);
irab[irb$l_rfa_vbn] = .bb[ock[.irab[irb$l_curbdb], bdb$l_vbn];
return rmssuc();
END:
                0337
03339
03340
03442
03445
033447
033447
0351
                                 RMS is to position to a non-deleted primary data record by an alternate
                                 key value.
                               BEGIN
                               LOCAL
                                    STATUS;
                                 Search all the SIDR arrays whose keys match the key in keybuffer 2
                                 according to the characteristics of the search until either a non-deleted
285
285
288
288
291
293
296
298
298
298
298
298
298
298
                                 primary data record is found, or all SIDRs with appropriate keys are
                                 exhausted.
                               STATUS = RM$SEARCH_SIDR();
                               IF .STATUS<0, 16> EQL RMSERR(RNF)
                                    BEGIN
                                    GLOBAL REGISTER
                                         R_BDB_STR;
                                    IF .IRAB[IRB$L_CURBDB] NEQ 0
                0360
                                    THEN
                0361
                                         RELEASE(IRAB[IRB$L_CURBDB]);
                0362
                                    END:
                0363
301
                0364
                               RETURN .STATUS
302
303
                0365
                0366
                               END:
304
                0367
305
                0368
                               END:
```

```
.TITLE RM3POSKEY
.IDENT \V04-000\
```

.EXTRN RM\$CSEARCH\_TREE
.EXTRN RM\$GETNEXT\_REC, RM\$RLSBKT
.EXTRN RM\$RU\_RECLĀIM, RM\$SEARCH\_SIDR
.PSECT RM\$RMS3,NOWRT, GBL, PIC,2

DD 00000 RM\$POS\_KEY::

						10	0 13 6-Sep- 4-Sep-	1984 01:55 1984 13:01	:13	VAX-11 BLi [RMS.SRC]R	ss-32 V4.0-7 M3POSKEY.B32	42 Pa ; 1	ge 7 (2)
		6B	41 20 76	A9 A9 0000G	E9	00002 00005 00008 0000B		PUSHL CLRB CLRL CLRW BSBW BLBC	R4 65(IR/ 32(IR/ 118(II RM\$CSI \$74(I)	AB)			0153 0233 0234 0235 0237
04 2B 10		66 66 66 54	000000000	A7 6025 005 A6 E50	95 12 E1 E1 B16 E8	00014 00016 0001A 0001E	1\$: 2\$:	TSTB BNEQ BBS BBC BBC MOVW JSB BLBS	11 <b>\$</b> #2, (1	REC_ADDR), REC_ADDR), REC_ADDR), LADDR), REC RECLAIM 5, 3\$	6 <b>\$</b>		0243 0247 0249 0258 0266 0280
	82 <b>AA</b> 01	8f A6		50 13 06 54	B1 13 11 B1	0002F 00034 00036 00038	<b>3\$</b> :	CMPW BEQL BRB CMPW	6\$ 4\$ RECORI	S, #33450 D_ID, 1(REC			0282 0286 0294
0.5		CF		03 0000G 0000G 50	30 E8 11	00044 00047	4\$: 5\$:	BNEQ BSBW BSBW BLBS BRB	RMSCSI STATU: 13\$				0304 0312
0E 06		66 0A 66 03	06 000000000 00B7	06 AA 05 EF CA 06	E1 E9 E0 16 91	00049 00040 00051 00055 0005B 00060		BBC BLBC BBS JSB CMPB BGEQU	6(IFAI	REC_ADDR), B), 7\$ REC_ADDR), RECLAIM FAB), #3			0320 0322 0324 0326 0332
	74	50 50 A9 50	91 01	A6 04 A6 50 A9	9A 11 3C B0	00062 00066 00068 00060	8\$: 9\$:	MOVZBL BRB MOVZWL MOVW	1 (REC. 9 <b>\$</b> 1 (REC. RO. 1	_ADDR), RO _ADDR), RO T6(IRAB)			•
	70	50 <b>A9</b> 50	20 10	A9 A0 01 24 0000G	D0	00074 00079 00070	10 <b>\$</b> :	MOVL MOVL MOVL BRB BSBW	32(IR/ 28(RO) #1, RO	AB), RO ), 112(IRAB )	)		0333 0334 0350
	82B2	51 8F	20	50 51 14 A9	12 D5	0008B	110.	MOVL CMPW BNEQ TSTL	12 <b>5</b> 32(1R/	ARCH_SIDR TATUS S, #33458 AB)			0352
		54	20 20	0F A9 A9 7E 0000G	13 00 04 04 30	0008E 00090 00094 00097		BEQL MOVI CLRL CLRL BSBW	12\$ 32(IR/ 32(IR/ -(SP) RM\$RL				0361
		5E 50		04 51 10	CO		12 <b>\$</b> : 13 <b>\$</b> :	ADDL2 MOVL POPR RSB	N', SI SIATUS N^M <r< td=""><td>S, RO</td><td></td><td></td><td>0364 0368</td></r<>	S, RO			0364 0368

; Routine Size: 165 bytes, Routine Base: RM\$RMS3 + 0000

306 0369 1 307 0370 1 END

RM3 V04

Page

D 13 16-Sep-1984 01:55:13 14-Sep-1984 13:01:33

VAX-11 Bliss-32 V4.0-742 [RMS.SRC]RM3POSKEY.B32;1

RM3POSKEY V04-000 : 308 0371 1 : 309 0372 0 ELUDOM

PSECT SUMMARY

Name Bytes

Attributes

RM\$RMS3

165 NOVEC, NOWRT, RD, EXE, NOSHR, GBL, REL, CON, PIC, ALIGN(2)

Library Statistics

File Symbols ----- Pages Processing Total Loaded Percent Mapped Time \$255\$DUA28:[RMS.OBJ]RMS.L32:1 3109 42 1 154 00:00.4

## COMMAND QUALIFIERS

BLISS/CHECK=(FIELD, INITIAL, OPTIMIZE)/LIS=LIS\$:RM3POSKEY/OBJ=OBJ\$:RM3POSKEY MSRC\$:RM3POSKEY/UPDATE=(ENH\$:RM3POSKEY)

Size: 165 code + 0 data bytes Run Time: 00:06.2 Elapsed Time: 00:20.1

Run Time: 00:06.2 Elapsed Time: 00:20.1 Lines/CPU Min: 3617 Lexemes/CPU-Min: 14508 Memory Used: 90 pages Compilation Complete

0326 AH-BT13A-SE

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